Annual report of the National Influenza Surveillance Scheme, 1998

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Abstract

The National Influenza Surveillance Scheme includes data from sentinel general practice consultations for influenza-like illness, laboratory reports of influenza and absenteeism rates from a national employer. The 1998 season was dominated by an increase in influenza A in all States and Territories and low influenza B activity. All influenza A isolates were characterised as influenza A (H3N2). Peak activity in 1998 was recorded in July and August. Data are coordinated, analysed and disseminated at a national level and published in*Communicable Diseases Intelligence* during the influenza season. *Commun Dis Intell* 1999;23:185-192.

Introduction

Influenza continues to be a major threat to public health worldwide because of its ability to spread rapidly through populations, showing a greater severity in the very young, the elderly and those affected by chronic disease or immunodeficiency.

The constant development of antigenic variants through antigenic drift is the basis for seasonal epidemics. The greater the variation, the greater the capacity of the virus to escape immune recognition and therefore the greater the epidemic potential. At irregular intervals, major 'antigenic shifts' occur resulting in a novel influenza strain of virus. In the absence of immunity to these new strains, they spread rapidly around the globe causing worldwide pandemics. In 1997 a cluster of human cases due to avian influenza virus, H5N1 occurred in Hong Kong raising concerns that this foreshadowed the beginning of a pandemic. Fortunately, the virus lacked the ability to be efficiently transmitted in human populations.

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This highlights the necessity for effective surveillance to detect changes that may arise in the influenza virus. The designing of vaccines and the guidance of public health measures in the event of epidemic and pandemic influenza, are both reliant on this information. The current influenza vaccine contains three virus strains (two type A and one type B), representing the influenza viruses likely to circulate in Australia in the upcoming winter.

National surveillance in Australia consists of community based surveillance from sentinel general practices, laboratory based surveillance, and absenteeism rates from a national employer. A national approach to the coordination of data collections, analysis and dissemination of information is achieved at the National Centre for Disease Control. This is the recommended approach for surveillance for influenza in pandemic and inter-pandemic periods as outlined in the recent publication *Towards an Australian Influenza Pandemic Preparedness Plan*. The plan emphasises a timely, representative and efficient surveillance system as the cornerstone of influenza control. [1]

Surveillance of influenza is conducted each year from the beginning of May to October. The aim of the surveillance is to provide timely information to public health departments, health care providers and the general public about levels of influenza activity and circulating strains. National Influenza Surveillance data are published monthly in *Communicable Diseases Intelligence (CDI).* Data are summarised in the annual report of the National Influenza Surveillance Scheme each year.

As well as routine surveillance for influenza, an additional Australia-wide surveillance program organised by a pharmaceutical company was conducted in 1998 as part of a multi-centre drug trial conducted in the southern hemisphere. The program is continuing again in 1999. A summary of the results of the study is presented in this report.

The world trends for influenza in 1998 and their relationship to Australian trends are also included in this report.

Surveillance methods

Routine surveillance of influenza in Australia comprises three systems:

- laboratory diagnosis, particularly virus isolation, detection or serological evidence,
- consultation rates for influenza illness by sentinel general practitioners,
- absenteeism data from a national employer.

Data from the latter two sources lack the specificity of laboratory data but are useful as surrogate markers of influenza activity and provide a quantitative measure of influenza illness. Absenteeism is a useful marker of social and economic disruption.

Laboratory surveillance

Laboratory reports of influenza are sent to the *CDI* Virology and Serology Laboratory Reporting Scheme (LabVISE). The scheme consists of 21sentinel laboratories throughout Australia. [3] Although virus isolation constitutes the gold standard for influenza diagnosis and surveillance specificity, it is reported less frequently than detection of viral antigen or serological evidence.

Criteria for a laboratory report of influenza are:

- direct detection of viral antigen, or
- isolation of the virus, or
- serological evidence of a recent infection.

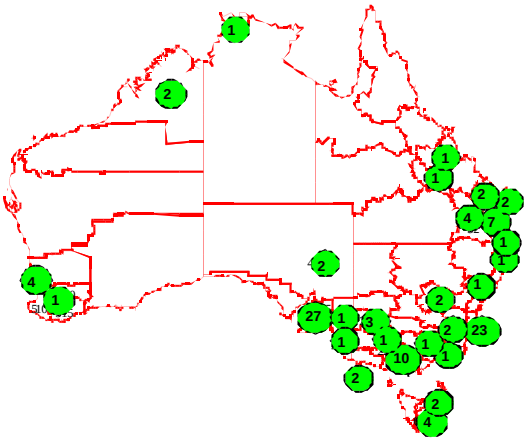
The World Health Organization (WHO) Collaborating Centre for Reference and Research on Influenza contributes reports on the subtypes and antigenic analysis of influenza viruses isolated throughout the year in Australia. This information is vital for the monitoring of influenza strains in Australia and the rest of the world, assessing the suitability of the current vaccine and determining the composition of the following year's vaccine.

Sentinel general practitioner surveillance

Sentinel general practitioner schemes that record influenza-like illness were included in the surveillance for 1998. These were: the Australian Sentinel Practice Research Network (ASPREN),[4] the New South Wales Sentinel General Practice Scheme, the Victorian Sentinel General Practice Scheme and Tropical Influenza Surveillance from the Northern Territory (NT).[5] The New South Wales (NSW) and the Victorian schemes report cases of influenza-like illness from the beginning of May to September each year. ASPREN and Tropical Influenza Surveillance from the NT report throughout the year.

ASPREN is currently the only national sentinel surveillance scheme that reports on cases of influenza-like illness. The current distribution of ASPREN sentinels is shown in Figure 1.

Figure 1. Geographic distribution of ASPREN sentinel sites, by number of sites and location



The case definitions used by ASPREN, Tropical Influenza Surveillance and the Victorian Sentinel General Practice Scheme were:

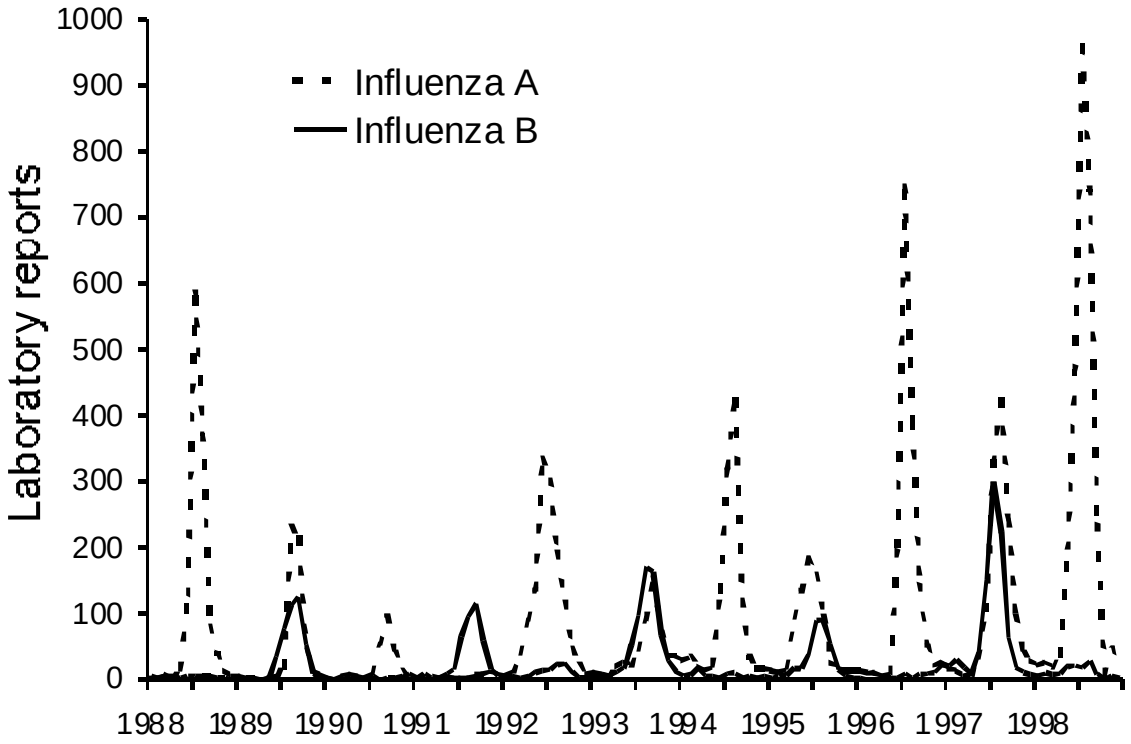
- viral culture or serological evidence of influenza virus infection,

or

- influenza epidemic, plus four of the criteria in (c),

or

Figure 2. Influenza A and B laboratory reports by date of specimen collection, Australia, 1988-98



Source: LabVISE, Australia, 1998

- six of the following:
- sudden onset (within 12 hours),
- cough,
- rigours or chills,
- fever,
- prostration and weakness,
- myalgia, widespread aches and pains,
- no significant respiratory physical signs other than redness of nasal mucous membranes and throat, and
- influenza in close contacts.

The case definition used by the NSW Scheme was all of the following:

- cough, and
- myalgia, and
- no abnormal respiratory physical signs other than inflammation of nasal mucous membranes and throat, and
- two of the following:
- sudden onset (less than 12 hours),
- rigours, chills or fever,
- prostration or weakness, or
- influenza in close contacts.

Absenteeism surveillance

Australian Post provided sick leave absenteeism data to the National Influenza Surveillance Scheme during 1998. Absenteeism was reported as the rate per 100 employees absent for 3 or more consecutive days each week. Rates were calculated on a weekly basis. The definition for absenteeism in 1998 was different to previous years in an attempt to improve specificity of data, and included cases of 3 or more days of absence rather than a single day.

Independently conducted influenza surveillance program

A pharmaceutical company conducted a surveillance program in Australia from April to September during 1998. Sentinel general practitioner sites and nursing home sites were selected in NSW, Queensland, Victoria, South Australia (SA) and Western Australia (WA). Nose and throat swabs were collected from individuals fitting the ASPREN clinical case definition for influenza-like illness and processed for viral isolation.

Results

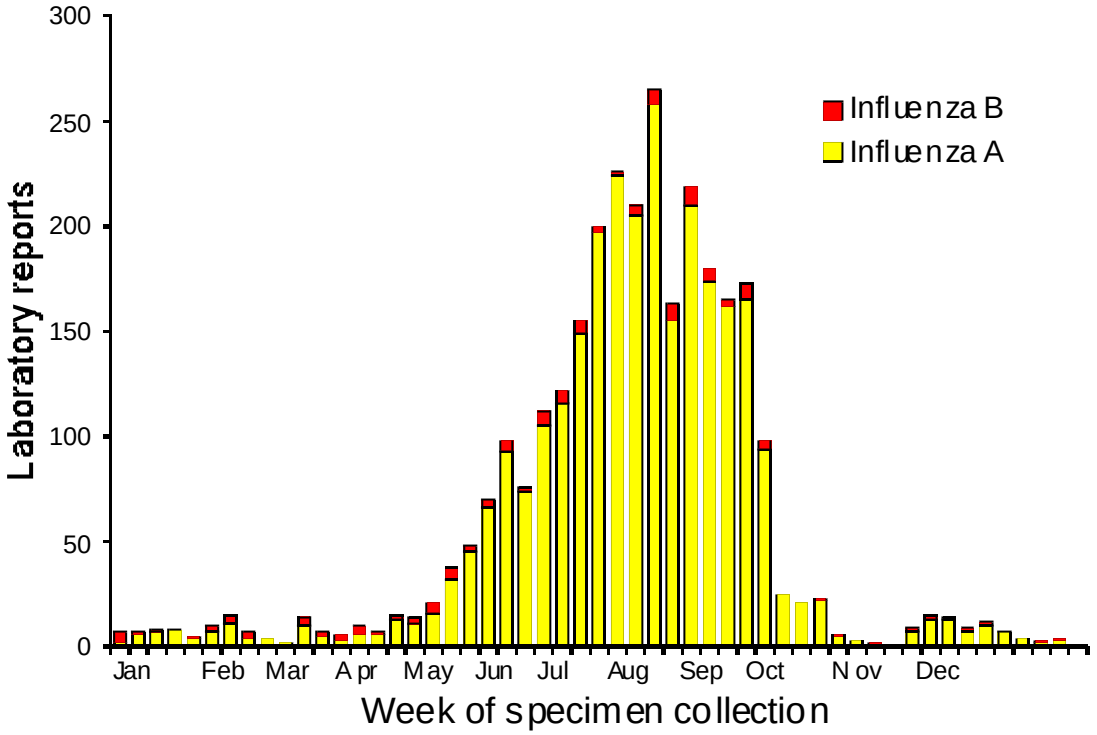
Laboratory surveillance

CDI Virology and Serology Laboratory Reporting Scheme

There were 2,943 influenza laboratory reports recorded by the LabVISE scheme, an increase from 1997 (2,797 influenza reports). The number of influenza reports in 1998 was the highest ever recorded by the scheme since its commencement in 1978 (Figure 2).The independent influenza surveillance program contributed 248 of these laboratory reports. This highlights the necessity for careful interpretation of laboratory data as there are many factors that can influence laboratory reporting practices.

The majority of influenza reports were influenza A (2,793, 95%) and the remainder were influenza B (150, 5%). There were no reports of untyped influenza (Figure 3). The number of reports of influenza B were low compared to 1997. This is consistent with the trend of influenza B to show increased activity in alternate years.

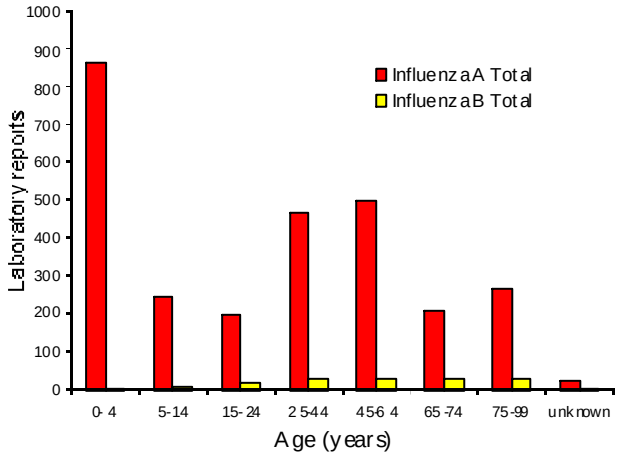
Figure 3. Influenza laboratory reports, by virus type and week of specimen collection, Australia, 1998



Source: LabVISE, Australia, 1998

The ratio of males to females for influenza was 1.3:1. Thirty-one per cent of all influenza A reports were from children aged 0-4 years. There were few reports of influenza B in the younger age groups with the majority of reports (61%) from persons over 45 year of age (Figure 4).

Figure 4. Influenza laboratory reports, by virus type and age, Australia, 1998



Source: LabVISE data, Australia,1998

The peak of laboratory reports was in July and August (Figures 5, 6 and 7). South Australia and Victoria both showed slightly earlier peaks than other States and Territories. A slight resurgence of laboratory reporting appeared in November and was particularly noticeable in SA.

South Australian laboratories reported influenza earlier than other States and Territories, followed by WA and then NSW and Victoria. The peak in SA and Victoria reports was in mid July, approximately two weeks ahead of other States and Territories. The NT reported no early laboratory reports of influenza.

South Australia contributed more laboratory reports of influenza than other States or Territories. Seventy-three per cent of all influenza B laboratory reports and 36% of influenza A reports were received from SA. This may indicate that laboratory diagnosis was sought in a larger number of influenza cases or is indicative of increased activity in SA (Figure 8). The independent pharmaceutical study had little impact on the number of reports in SA as it

Figure 5. Influenza A laboratory reports, by week, SA and WA, 1998

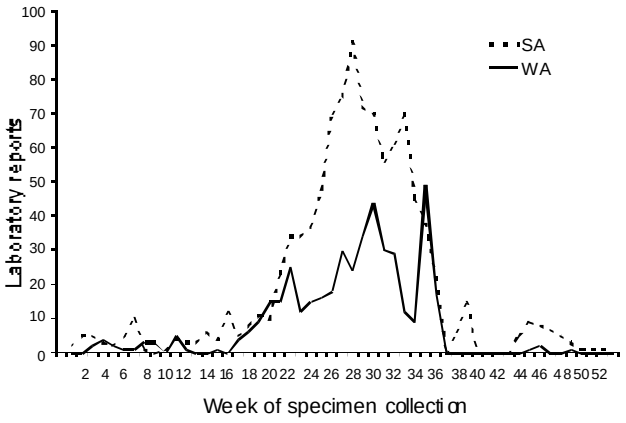


Figure 6. Influenza A laboratory reports, by week, ACT, NSW, Tasmania, and Victoria, 1998

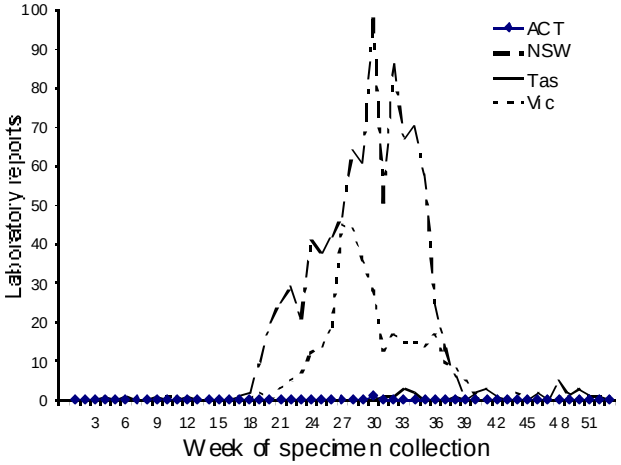


Figure 7. Influenza A laboratory reports, by week, NT and Queensland, 1998

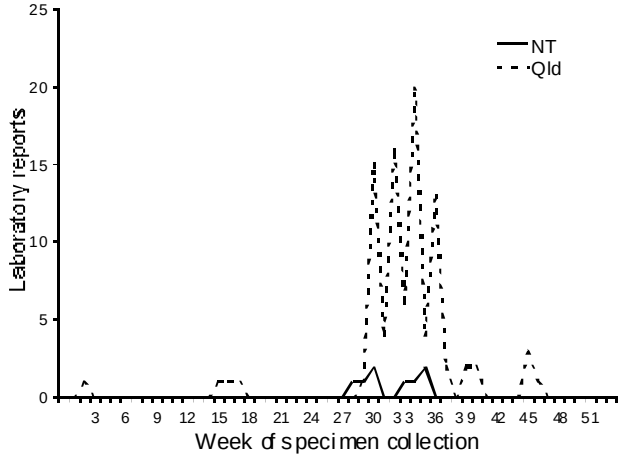
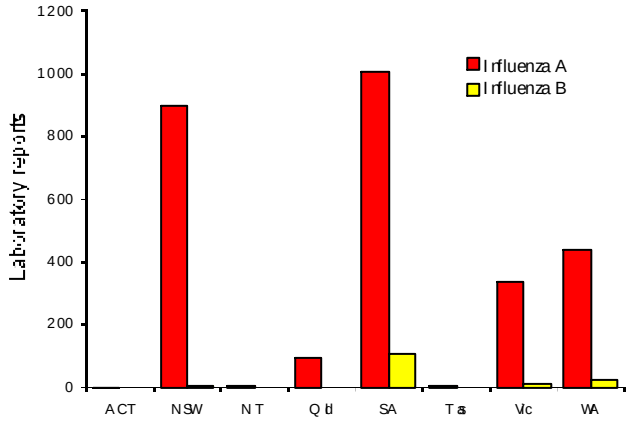


Figure 8. Influenza laboratory reports by virus type and State and Territory, 1998



Source: LabVISE, Australia, 1998

only contributed 17 laboratory reports to the overall number.

WHO Collaborating Centre for Influenza Reference and Research

Although LabVISE figures indicated that approximately 5% of laboratory diagnosed influenza in Australia during 1998 was due to influenza B, only one isolate of 1,127 viable isolates received at the WHO Collaborating Centre was identified as an influenza B virus. The remaining isolates were all characterised as influenza A (H3N2) viruses. The influenza B strain was closely related to B/Beijing/184/93 vaccine strain. All of the influenza A (H3N2) isolates were antigenically related to the A/Sydney/5/97 vaccine strain. Approximately 30% of the influenza A isolates showed some reduction in their reaction with the reference antisera (including reaction to the A/Sydney/5/97 strain). Antisera against these low-reacting strains had a similar reactivity profile to the reference antiserum and did not indicate significant antigenic drift.

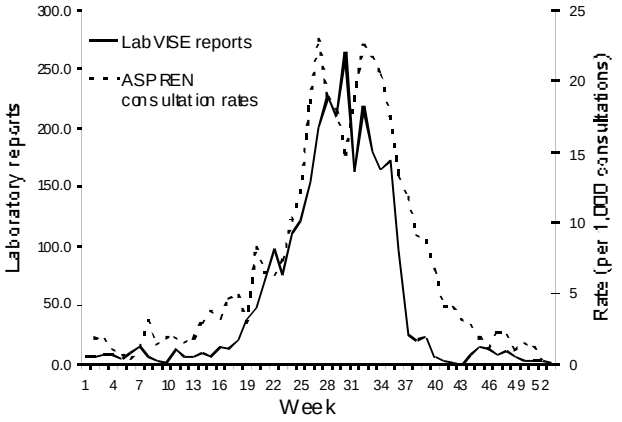
Furthermore, when viruses from specimens yielding low reactive strains were isolated directly in embryonated eggs, as would be required for vaccine production, they showed similar reactivity as the reference strain with antisera. Genetic analysis of the low-reacting strains also demonstrated only minor changes from the A/Sydney reference strain.

Sentinel general practitioner surveillance

The ASPREN scheme recorded low consultation rates for influenza-like illness in the early part of the year and two distinct peaks in July and August. This is the same peak time as laboratory surveillance reports (Figure 9).

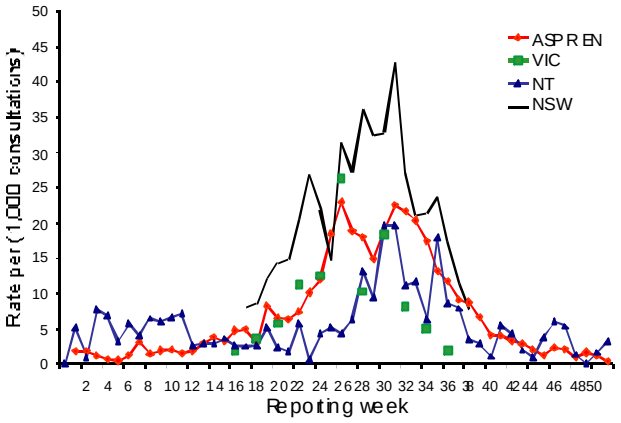
Consultation rates for ASPREN peaked at 25 per 1,000 consultations in 1998; lower than the peak of 35 in 1997. Analysis of the ASPREN data by State reveals the peak in SA and Victoria occurred around week 27 while that in NSW and Queensland occurred around week 32. These four States supply the bulk of the reports to ASPREN. The peak rate was much higher in SA than any other State.

Figure 9. Influenza laboratory reports by week of specimen collection and ASPREN consultation rates, by week of consultation, 1998



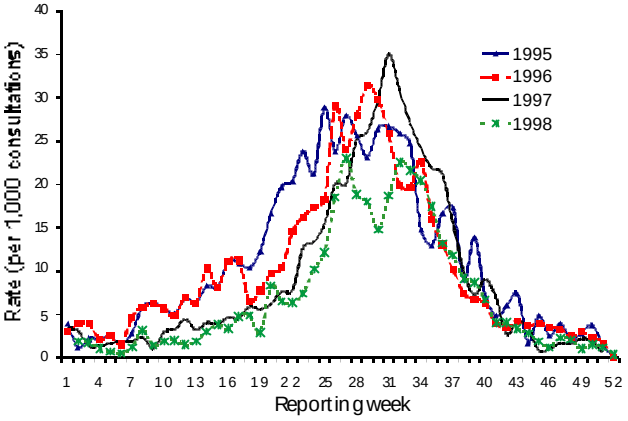
Source: LabVISE scheme, ASPREN scheme, Australia, 1998

Figure 10. Sentinel general practitioner consultation rates, influenza-like illness, by week and scheme, 1998



Source: ASPREN, NSW Sentinel General Practice Scheme, Victorian Sentinel General Practice Scheme, Tropical Influenza Surveillance, 1998

Figure 11. ASPREN consultation rates, influenza-like illness, by week, 1995-98



Source: Australian Sentinel Practice Research Network, 1995-98

The Victorian Sentinel General Practitioner Scheme demonstrated similar consultation rates. The NSW General Practitioner Surveillance Scheme had the highest rates of all schemes. In this State the peak rate of 43 reports of influenza-like illness per 1,000 consultations occurred in August. The NT Tropical Influenza Surveillance Scheme showed a higher rate than the ASPREN scheme during the first 3 months of the year, but peaked later than other States in August and September (Figure 10). This pattern is typical of the NT and other tropical regions.[5,7,8] The Victorian and the NSW General Practitioner Surveillance Schemes are unable to detect early or late influenza activity as they only record influenza activity from the beginning of May until September.

The ASPREN scheme is a national scheme reflecting overall activity of influenza in Australia. Consultation rates reported in 1998 were the lowest since 1995, characterised by a bimodal distribution which is a result of the different reporting peaks by States (Figure 11).

Fifty-five per cent of reports of influenza-like illness from the ASPREN scheme were from persons in the 15-44 year age group (Figure 12).

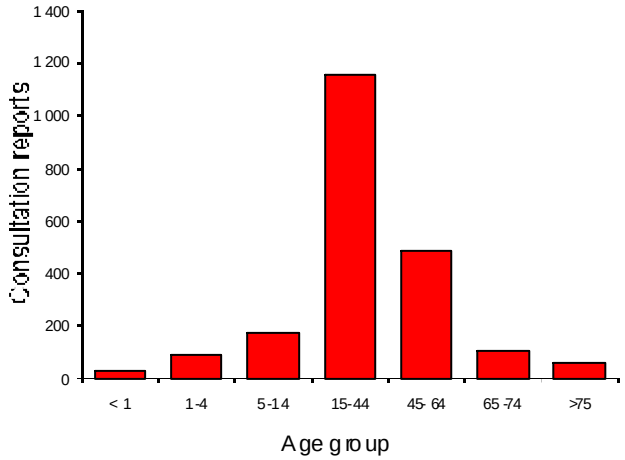
Absenteeism surveillance

The rate of national absenteeism of 3 days per week reported by Australian Post remained between 0.2 (per 100 employees) and 0.35 over the winter months with peak activity in July. Absenteeism declined to half the peak winter rate in early spring (Figure 13).

Independently conducted influenza surveillance program

As shown in the LabVISE data, influenza peaked earlier in WA and SA than in the eastern States. All influenza A isolates were typed as A Sydney 5/97 H3N2-like viruses.

Figure 12. ASPREN reports of influenza-like illness, by age group, Australia, 1998

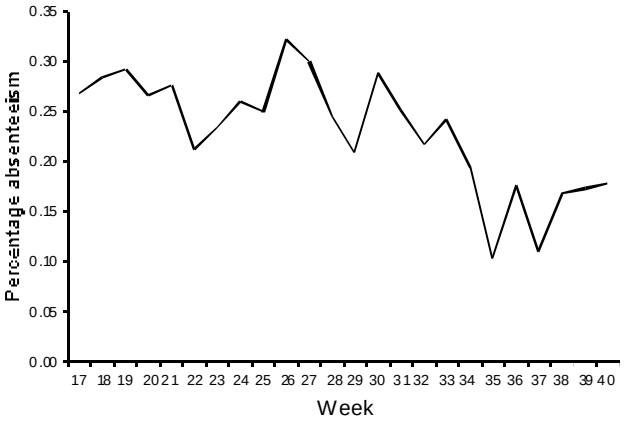


Source: Australian Sentinel Practice Research Network, 1998

Table 1. Independent surveillance program, influenza isolates from specimens, by State, 1998

State	Number of specimens	Number of influenza isolates	Per cent
NSW	435	73	17%
Queensland	162	50	31%
Victoria	110	25	23%
SA	215	17	8%
WA	386	83	22%
Total	1,308	248	19%

Figure 13. Absenteeism rates in Australian Post, May to September, by week of the year, 1998



Source: Australia Post

Only one specimen yielded influenza B. The number of influenza isolates from each State is shown in Table 1.

World Trends

The pattern of influenza in New Zealand was similar to Australia. New Zealand consultation rates for influenza-type illness remained low during May and June and started to increase in July. Rates showed a peak in July and again in August. Influenza A predominated in 1998, only 2% of cases were influenza B. Unlike Australia, where no influenza A (H1N1) was detected, influenza A (H1N1) similar to A/Johannesburg/82/96 accounted for 53% of total isolates. This strain circulated exclusively in the North Island. Influenza A (H3N2) similar to A/Sydney/5/97 accounted for 20% of isolates and this strain spread throughout most of New Zealand. Overall influenza activity in New Zealand 1998 occurred at a low to moderate level compared to 1996 and 1997 seasons.

Between March and September 1998 epidemic or widespread influenza activity was reported from a number of southern hemisphere countries. Influenza A viruses were predominantly of the A (H3N2) subtype antigenically related to A/Sydney/5/97; no new antigenically distinct variant was defined. In many countries influenza A (H1N1) viruses were also isolated, the majority of these isolates were antigenically similar to A/Bayern/7/95 while A/Beijing/262/95-like strains were isolated sporadically. Relatively few laboratory confirmed cases of influenza B were reported. B/Beijing/184/93-like strains were generally distributed throughout the world; cocirculation with B/Beijing/243/97-like strains were limited to Asia.[9]

In the northern hemisphere reports of influenza began in October 1998. Influenza A (H3N2) antigenically related to A/Sydney/5/97 predominated, although influenza B circulated widely and predominated in some countries. The majority of influenza B was antigenically related to B/Beijing/184/93-like strains. However, in Asia this strain cocirculated with B/Victoria/2/87-like viruses. Few laboratory confirmed cases of influenza A (H1N1) were reported, the majority of these were antigenically related to A/Beijing/262/95 vaccine strain.[10]

Viruses of the A/Sydney/5/97-type, which was first identified in Australia (June1997) have established around the world becoming the predominant strain in most regions. This strain circulated almost exclusively in Australia in 1998.

Discussion

The 1998 influenza season in Australia was dominated by influenza A and very little illness from influenza B. The low level of influenza B was predicted as outbreaks tend to occur in alternate years, and 1997 had been a year of increased activity.[6] All influenza A isolates were characterised as influenza A (H3N2) antigenically related to the A/Sydney/5/97 vaccine strain used in the 1998 vaccine.

The measure of influenza illness in the community was lower in 1998 than in the years 1995 to 1997 according to general practitioner surveillance.[6,11,12] This appears contradictory to the higher number of laboratory reports recorded. The numbers of laboratory reports are likely to be inflated as a result of increased laboratory testing from an independent multi-center drug trial conducted in 1998. However, this alone does not explain the increase in laboratory reports of influenza from some States. This highlights the necessity for careful interpretation of laboratory data.

Influenza-like illness peaked throughout the winter months with one peak occurring in July and another four weeks later in August. As in previous years, the earliest reports of influenza-like illness were from the NT, heralding the beginning of the influenza season. Early reports of influenza-like illness were also received from SA. Laboratory reports of influenza showed much the same time distribution as influenza-like illness recorded in ASPREN data, except the first peak of laboratory reports in July was two weeks later. This minor delay between onset of general practitioner reports and laboratory reports may reflect a delay in laboratory testing and reporting. A late resurgence of influenza A (H3N2) occurred in November and was detected in both the laboratory and sentinel general practitioner schemes.

The morbidity from influenza in the elderly population is not reflected in the surveillance data. Thirty per cent of all laboratory reports originated from children in the 0-5 year age group and the peak age distribution of reports of influenza-like illness to ASPREN, was 15-44 years. The laboratory reports in young children may reflect increased incidence as well as increased testing practices for children. The general practitioner reports of influenza-like illness probably indicate the age distribution of persons presenting to general practitioners.

National absenteeism rates reported by Australian Post added little information to the other surveillance systems and remained relatively insensitive to the low levels of influenza circulating in 1998, despite changes to improve the specificity of the system. These data may prove more valuable in a year of high incidence of influenza.

The composition of the influenza vaccine for 1999 was determined on the basis of the strains in circulation during 1998 in Australia and the rest of the world. The Australian Influenza Vaccine Committee (AIVC) made the following

recommendations for the 1999 influenza vaccine based on the recommendations of the World Health Organization:

- H1N1 an A/Beijing/262/95-like strain
- H3N2 an A/Sydney/5/97-like strain
- Ba B/Beijing/184/93-like strain. [13]

This differs from the 1998 vaccine by the replacement of A/Bayern/7/95-like strain with A/Beijing/262/95-like strain which induces antibodies to both viruses.[12]

Vaccination against influenza is the most effective method of reducing the effect of influenza. Awareness among health care providers of current influenza activity and circulating strains is necessary for reducing the impact of influenza and related complications. As an integral part of control of influenza, the National Influenza Surveillance Scheme will continue conducting surveillance in the winter of 1999.

Acknowledgements

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Typhoid fever, update

After the confirmation of cases of typhoid fever from passengers on a cruise ship, a health warning was issued on 8 June 1999 to all passengers and crew. This cruise had departed Cairns, Australia on 12 May 1999. The ship travelled to Port Moresby, Samarai Island, Milne Bay (in PNG), Honiara (Solomon Islands), Champagne Bay and Vila (Vanuatu). After disembarkation in Sydney on 25 May, the passengers and some of the crew dispersed to all six Australian States, the Australian Capital Territory (ACT) and New Zealand.

This alert, from the Communicable Diseases Network of Australia New Zealand (CDNANZ), advised that 3 passengers on this cruise were confirmed typhoid fever cases. At this time there were 2 confirmed cases in Victoria and 1 in New South Wales (NSW). All of these notified cases attended the Kokoda Trail tour on 14 May.

The alert initiated a national response coordinated by a working party nominated by CDNANZ.

Most passengers and crew who had returned to Queensland, ACT, Western Australia, South Australia and New Zealand were interviewed. In NSW and Victoria, only passengers and crew who had attended the Kokoda trail tour were interviewed.

All passengers and crew who were interviewed were asked to submit at least one faecal specimen. In some States blood and urine samples were requested as well. Passengers and crew who were working in occupations with a high risk for transmission for *Salmonella* typhi were required to submit three faecal specimens, with clearance for return to work pending return of negative samples.

In the intervening period between the detection of the first case and 30 June 1999 a total of 12 participants of the Kokoda Trail tour had *Salmonella* typhi detected in specimens. There were 4 cases from Victoria, 6 from NSW and 1 each from Western Australia and New Zealand. Surveillance is ongoing.

Annual report of the Australian Gonococcal Surveillance Programme, 1998

The Australian Gonococcal Surveillance Programme[1]

Abstract

The Australian Gonococcal Surveillance Programme examined 3,583 isolates of *Neisseria gonorrhoeae* in 1998. Again in 1998 the rates and sites of infection and antibiotic susceptibility patterns varied considerably between regions, reflecting considerable differences between rural and urban gonorrhoea in Australia. Resistance to the penicillin and quinolone groups of antibiotics was highest in urban centres, but penicillins remained suitable for use in many parts of rural Australia. Quinolone-resistant gonococci continued to be concentrated in New South Wales (NSW) where sustained domestic transmission of these strains was maintained but at a lower rate than in 1997. Endemic transmission of Quinolone-resistant gonococci in homosexually active men was found for the first time. Quinolone-resistant gonococci in other centres continued to be isolated mostly from overseas travellers and at a lower frequency. All isolates remained sensitive to spectinomycin and ceftriaxone. Strains showing high level tetracycline resistance increased by 300% in NSW and were acquired predominantly through local contact. A significant increase in the number of isolates was recorded in NSW and Victoria in 1998, this increase being mainly attributable to an increase in gonorrhoea in homosexually active males. Strains examined in South Australia (SA), NSW and Victoria were predominantly from male patients and rectal and pharyngeal isolates were common. In other centres the male to female ratio was lower, and most isolates were from the genital tract in rates similar to those occurring in 1997. *Commun Dis Intell* 1999;23:193-197.

Introduction

The Australian Gonococcal Surveillance Programme (AGSP) is a collaborative programme conducted by reference laboratories in each State and Territory. The primary aim of the programme is to monitor antibiotic susceptibility of Australian isolates of *Neisseria gonorrhoeae (N. gonorrhoeae)* to assist in the formulation of treatment regimens appropriate to proper management of gonorrhoea.

Control of gonorrhoea is a complex issue which requires a sustained and integrated approach addressing behavioural, educational and treatment issues. There is renewed interest in the means available to control the spread of gonorrhoea following converging epidemiological and biological studies [1-4] showing the significant role of this disease as an amplification factor in the spread of HIV. One essential element for any programme for the control of gonorrhoea is the availability of appropriate antibiotic treatment. Antibiotic treatment of gonorrhoea is best administered as single dose therapy to enhance compliance. The gonococcus has a well demonstrated capacity to develop antibiotic resistance by numerous chromosomal and extrachromosomal mechanisms. Continuing and long term surveillance is required to monitor and respond to changes in resistance which can occur in a short space of time.[5]

There is a close correlation between the likely outcome of treatment and the *in vitro* susceptibility of the causative organism. However, treatment is usually provided before results of susceptibility tests on individual isolates can be performed. Treatment regimens are therefore formulated using knowledge of the *in vitro* sensitivity of prevalent gonococci.[5] That is, the overall pattern of susceptibility of prevalent gonococci is the critical determinant of appropriate antibiotic therapy rather than individual strain susceptibility identified on a case by case basis.[6]

Quarterly reports have been provided to *Communicable Diseases Intelligence (CDI)* since antibiotic sensitivity data were first produced by the AGSP in 1981.[7-10] Initially only data on penicillin resistance were reported and the AGSP documented the appearance and spread of penicillinase producing gonococci (PPNG) in Australia.[8] Monitoring of resistance to other antibiotics was added as newer therapeutic agents became available. Currently the emergence and spread of gonococci resistant to the quinolone antibiotics, agents widely used in Australia, is a particular concern. This is the third annual summary of AGSP data in *CDI* and provides information on trends in disease as well as antibiotic sensitivity data.

Methods

The AGSP comprises participating laboratories in each State and Territory (see acknowledgements). It is a collaborative network of laboratories which seeks to obtain isolates for examination from as wide a section of the community as possible and both public and private sector laboratories refer isolates to regional testing centres. For example, strains from the Northern Territory (NT) are isolated in Alice Springs, Katherine and Darwin and the laboratories of Western Diagnostic Pathology and Queensland Medical Laboratory in the NT and further tested in AGSP centres in Perth, Adelaide and Sydney.

The sources of isolates remained relatively unchanged in 1998. Gonococci isolated in and referred to the

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Table 1. Gonococcal isolates, Australia, by sex, site and region (excluding those from the ACT and Tasmania), 1998

	Site	Sydney	Melbourne	Brisbane	Adelaide	Perth	Northern Territory	Aust
Male	Urethra	1,023	438	336	67	320	306	2,495
	Rectal	158	63	8	7	5	4	246
	Pharynx	63	22	9	7	0	2	109
	Other/NS	6	4	19	3	3	4	36
	Total	1,250	527	372	84	328	316	2,886
Female	Cervix	121	33	133	15	118	234	654
	Other/NS	15	5	11	1	6	5	43
	Total	136	38	144	16	124	239	697
TOTAL		1,386	565	516	100	452	555	3,853

participating laboratories were examined for antibiotic susceptibility to the penicillins, quinolones, spectinomycin and third generation cephalosporins and for high level resistance to the tetracyclines, by a standardised methodology.[8] The AGSP also conducted a programme-specific quality assurance (QA) programme.[9] Antibiotic sensitivity data were submitted quarterly to a coordinating laboratory which collated the results and also conducted the QA programme. Additionally the AGSP received data on the sex and site of isolation of gonococcal strains which allows consideration of certain trends in disease patterns. The geographic source of acquisition of resistant strains was ascertained whenever possible.

Results

Numbers of isolates from which susceptibility patterns were derived

There were 3,583 isolates examined in 1998 (Table 1). One-thousand three-hundred and eighty-six gonococci (39% of the Australian total) were isolated in NSW, 565 (16%) in Victoria, 555 (15%) in the NT, 516 (14%) in Queensland, 452 (13%) in Western Australia (WA), and 100 (3%) in South Australia (SA) with small numbers in Tasmania and the Australian Capital Territory (ACT).

Compared with data from the same sources in 1997, the greatest changes in the number and percentage of isolates were the increases in NSW (from 902) and Victoria (from 362). In both of these States the increase was of the order of 50% over the previous year. There was also an increase in the number of isolates available from the NT from 393 in 1997 to 555 in 1998, but a decrease in strains examined in Queensland. The numbers of isolates in SA and WA were only slightly different from the previous year.

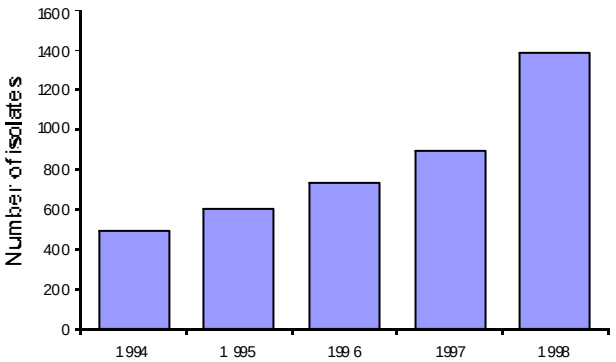
The increase in the number of isolates in NSW represents an acceleration of a trend evident since 1994 (Figure 1), but the increase in Victoria was first evident in 1998.

Source of isolates

There were 2,886 strains from men and 697 from women, with a male to female (M:F) ratio of 4.1:1. The number of strains from men increased from 2,233 in 1997, and strains from women increased from 594 in 1997, but the M:F ratio increased only slightly from the 3.7:1 figure in 1997.

The M:F ratio was higher in Victoria (13.8:1), SA (5.2:1), and NSW (9.2:1) where strains were obtained more from urban populations, but lower in WA (2.6:1), Queensland (2.6:1) and lowest in the NT(1.3:1), reflecting the large non-urban component of gonococcal disease in those regions. Male rectal and pharyngeal isolates were most frequently found in NSW (together accounting for 17.7% of male isolates there), SA (16.6%) and Victoria (16%). This pattern is similar to that noted in 1996 and 1997. Two per cent of isolates are shown as being isolated from 'other' sites. These included 9 cases of disseminated gonococcal infection, 7 in men and 2 in women. Isolates from urine samples collected were regarded as genital tract isolates. There were a small number of isolates from the eyes of new-born infants.

Figure 1. The number of gonococcal isolates from similar sources in New South Wales, 1994 to 1998



Antibiotic susceptibility patterns

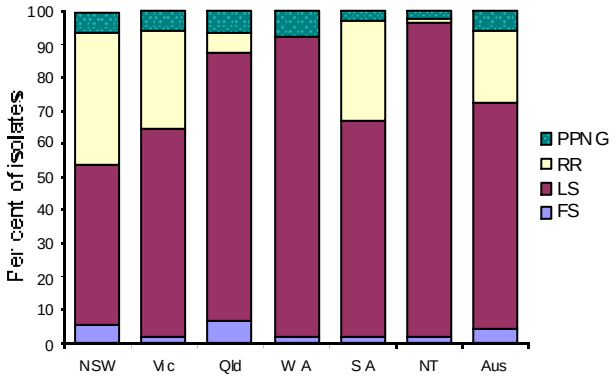
In 1998 the AGSP reference laboratories examined 3,853 gonococcal isolates for sensitivity to penicillin (representing this group of antibiotics), ceftriaxone (representing later generation cephalosporins), ciprofloxacin (representing quinolone antibiotics) and spectinomycin and for high level resistance to tetracycline (TRNG). However, the patterns of gonococcal antibiotic susceptibility differed greatly between the various States and Territories. For this reason data are presented by region as well as aggregated for Australia as a whole.

Penicillins

Resistance to the penicillin group (penicillin, ampicillin, amoxycillin) may be mediated by the production of beta-lactamase (penicillinase-producing *N. gonorrhoeae* -PPNG) or by chromosomally-controlled mechanisms (CMRNG).

Chromosomal resistance is expressed as the minimal inhibitory concentration in mg/L (MIC) which is the least amount of antibiotic which inhibits *in vitro* growth under defined conditions. The categorisation of strains in Australia in 1998 by penicillin MIC is shown in Figure 2. The MIC reflects the expression of multiple and different chromosomal changes present in an organism. These multiple changes result in incremental increases in the MIC and strains are classified as fully sensitive (FS, MIC ≤ 0.03 mg/L), less sensitive (LS, MIC 0.06 - 0.5 mg/L) or relatively resistant (RR, MIC ≥1 mg/L). PPNG are a separate (resistant) category. Infections with strains in the less sensitive or fully sensitive categories usually respond to therapy with standard treatment regimens with the penicillins. Infections with strains which are PPNG or in the relatively resistant category (CMRNG) usually fail to respond to the penicillins.

Figure 2. Penicillin resistance of gonococcal isolates, Australia, 1998, by region



FS Fully sensitive to penicillin, MIC ≤ 0.03 mg/L

LS Less sensitive to penicillin, MIC 0.06 - 0.5 mg/L

RR Relatively resistant to penicillin, MIC ≥ 1 mg/L

PPNG Penicillinase producing *Neisseria gonorrhoeae*

The 782 (21.8%) isolates resistant to penicillin by chromosomal mechanisms, CMRNG, in 1998 was double the 361 (12.8%) recorded in 1997. Strains of this type were concentrated in Victoria (165 CMRNG, 30% of all isolates), NSW (545 CMRNG, 40% of all isolates) and SA (30 CMRNG, 30%). In contrast there were no CMRNG amongst WA isolates and 8 (1.4%) in NT strains. The 32 CMRNG in Queensland represented 6% of all isolates there.

The number of PPNG rose slightly in 1998 to 206, but declined as a proportion of all isolates. Again the distribution of PPNG differed by region. New South Wales had the highest number of PPNG, 92, and WA the highest proportion, 7.5%. PPNG were also prominent in Victoria and in Queensland where about 6% of strains were PPNG. Tasmania was the only State where PPNG were not isolated in 1998. Most isolates were from patients infected overseas.

Ceftriaxone and Spectinomycin

All strains from all parts of Australia were sensitive to these injectable agents.

Quinolone antibiotics

Resistance to the quinolone antibiotics is mediated only by chromosomal mechanisms and is thus incremental. The AGSP uses ciprofloxacin as the representative quinolone and defines altered resistance as an MIC≥ 0.06 mg/L. Treatment with currently recommended doses of 500 mg of ciprofloxacin is usually, but not always, effective for strains with this less developed resistance, but lower doses of the antibiotic will more often result in treatment failure. Treatment failure is also likely even with high doses in infections with strains with MICs of 1 mg/L or more. Currently gonococci with MICs up to 16 and 32 mg/L are being seen in Australia.

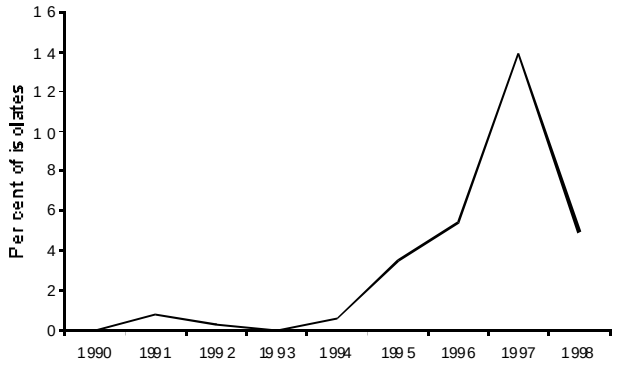
In 1998 a total of 186 (5.2%) of gonococcal isolates displayed altered sensitivity to the quinolones (QRNG). This is less than the 204 (7.2%) QRNG seen in 1997 but still a much higher number than 108 (4%) QRNG seen in 1996. QRNG were found in all States except Tasmania. Victoria had 28 (5%) QRNG, Queensland 25 (4.8%), WA 1 (3.3%) with smaller numbers in SA and the NT. Again the biggest change in QRNG numbers in 1998 occurred in NSW. The 104 (7.5%) QRNG was considerably less than the 144 QRNG (16%) detected there in 1997. An increase in the number and proportion of QRNG had been noted in NSW in the December quarter of 1996 and this rate of isolation was sustained throughout 1997 and the early part of 1998, but declined in the latter part of the year (Figure 3). The spread of QRNG in Sydney by local as opposed to overseas contact also declined throughout 1998. While most other centres showed a slight change in the number and percentage of QRNG isolated, the pattern of acquisition outside NSW is still mainly through overseas contact.

A new feature of QRNG spread in NSW in 1998 was the isolation of these strains from homosexually active men. Prior to 1998 QRNG had been transmitted only by heterosexual contact.

High level tetracycline resistance

Two-hundred and forty-one high level tetracycline resistant *N. gonorrhoeae* (TRNG, 6.7% of isolates) were detected throughout Australia in 1998, a slight increase over the 1997 numbers. Most TRNG were found in NSW (147), representing 10.6% of all isolates. There were 34 TRNG in

Figure 3. **High level quinolone resistance (MIC ≥ 1 mg/L) in gonococci in New South Wales, 1990 - 1998**



WA, 32 in Queensland, 16 in Victoria, and 10 in the NT. Infections with TRNG were mainly acquired overseas in Indonesia, Thailand and Singapore. However an increasing number of isolates were acquired through local contact, especially in NSW.

Discussion

Major regional differences in the antibiotic susceptibility of *N. gonorrhoeae* have been evident for many years and continued in 1998. There was also considerable volatility in the patterns of susceptibility. As a point of reference, the World Health Organization recommends that an antibiotic should no longer be used for treatment when 5% of isolates are resistant to its action.

A high proportion of the gonococci isolated in urban centres have been resistant to the penicillins for many years and this trend was increased in 1998. Between 30% and 50% of isolates in NSW, Victoria and SA were resistant to this group of antibiotics. Most of this resistance was chromosomally mediated (CMRNG) and in locally acquired strains. PPNG have declined in most centres to relatively low proportions, and most PPNG were from imported infections. The proportion of CMRNG in Queensland, the NT and WA remains low so that penicillins remain a suitable treatment strategy in these settings. However, fully sensitive isolates have also declined considerably in numbers indicating an almost inexorable increase in MICs to the point where it seems inevitable that resistance to the penicillins will also emerge in these regions, posing significant problems for management of gonococcal disease.

Patterns of resistance to the quinolone antibiotics also showed a degree of volatility in 1998, especially in NSW. The high levels of resistance to the quinolones evident in 1997 decreased so that QRNG represented 7.5% of isolates. However, endemic transmission of QRNG continued in NSW in 1998 and for the first time was evident in homosexually active males. The proportion and patterns of QRNG in other centres altered little from 1997 and were nearly all imported infections. The quinolone group of antibiotics, with the penicillins, represented the only oral treatments for gonorrhoea available in Australia.

The continuing presence of QRNG in numbers shown in these data remains a cause for concern, especially as Australia is located in a region where the prevalence of QRNG is high. The AGSP used ciprofloxacin as the representative quinolone for assessing resistance to this antibiotic group. Recently, later generation quinolones with increased activity have become available in Australia. Whether this increased activity translates into an ability to treat those QRNG at present found in Australia will require assessment.

All gonococcal isolates were susceptible to the third generation cephalosporin ceftriaxone. Oral third generation cephalosporins are not available in Australia. Earlier generation cephalosporins are less active in gonococcal disease than ceftriaxone. They should be used with caution as overseas studies have indicated that where CMRNG are present in high numbers, (as is the case in Australia), these agents represent suboptimal therapy.

In 1998 the number of TRNG was about 50% more than the 1997 figure. Most of this increase was in NSW where the number of TRNG isolated increased from 47 to 147 and resulted from sustained domestic transmission. Although tetracyclines are not a recommended treatment for gonorrhoea, the appearance and spread of these strains is yet another indication of failure to control this disease.

Although the regional sensitivity patterns provide a more precise guide to suitable treatment in different localities than aggregated Australian data, trends towards resistance noted in the larger urban centres have in the past been indicative of subsequent directions in resistance in other regions. For this reason it is essential to maintain an integrated approach to susceptibility surveillance in Australia.

It has also been known for some time from other epidemiological evidence that rates of gonococcal disease differ greatly in the various jurisdictions in Australia. Rates of disease in rural and Northern Australia may be 100 times those in urban centres. The AGSP has until now been able to confirm these findings with its sample of isolates obtained from relatively unchanging sources. Additionally AGSP data record site of isolation which is not always available in other data sets. This has allowed the AGSP to comment on trends in gonococcal disease in Australia as a by-product of its prime role in antibiotic susceptibility surveillance.[11]

This situation may change as the use of non-culture based methods (such as nucleic-acid-based amplification assays - NAA) increases and the availability of cultures and accompanying clinical data is altered. However, for 1998 the impact of NAA on AGSP data has not been significant, so trend data analysis from traditional sources was still possible.

From these data it seemed that the increase in the number of cases of gonorrhoea noted in NSW in 1997 had accelerated and that a similar situation had arisen in Victoria. In both States the number of gonococcal isolates increased by more than 50% in 1998. In the case of NSW compounding increases in gonococcal isolation rates of 20% had been noted since 1994. The increase in 1998 was on top of these previous increases in isolation rates whereas in Victoria it was the first increase for some years. In both NSW and Victoria the increase in disease

appeared to be in homosexually active males. In NSW the number of rectal and pharyngeal isolates in males increased from 124 in 1997 to 221 in 1998. In Victoria the corresponding figures were 68 to 85. An increasing incidence of gonorrhoea in homosexually active men has been reported from the United States of America.[12]

In NSW there also appeared to be an increase in heterosexually transmitted gonorrhoea with the number of isolates from women doubling from 1997 to 1998 (68 to 136). In Victoria the number of isolates from females in 1998 was essentially unchanged from the 1997 figure. The M:F ratio of disease increased in Victoria from 9:1 in 1997 to almost 14:1 in 1998. In NSW the additional numbers of isolates from females saw this ratio decrease from 12:1 to 9:1 in 1998. In the NT the number of isolates available for testing increased from just under 400 to 555. This may have been the result of initiatives designed to detect gonorrhoea and other STDs in that jurisdiction. The M:F ratio of disease altered less in the NT, SA, WA and Queensland in 1998.

In 1997 it was noted that although all participating centres have an urban and non-urban component in their mix of isolates, the relative contributions of each differs. The greater urban impact is reflected in the high male to female ratio and rate of extra-genital infection in NSW, Victoria and SA. The different pattern of gonococcal disease in Northern Australia is shown in the lower male to female ratio and high rate of genital tract isolates in data from Queensland, WA and the NT. This pattern continued in 1998.

The global decline in incidence of gonococcal disease in some more developed countries has now been arrested and, in parts of Australia at least, the number of cases is again increasing. The choice of suitable treatment for gonorrhoea in Australia is becoming increasingly restricted, especially in the larger cities, so that the unenviable situation of having more disease that is more difficult to treat is now arising. Continued monitoring of resistance patterns is required to optimise treatment regimens. Use of non-culture based diagnostic techniques decreases the opportunity for susceptibility surveillance in gonococci, and the development of strategies for maintenance of this surveillance requires urgent attention.

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Rotavirus diversity: what surveillance will tell us

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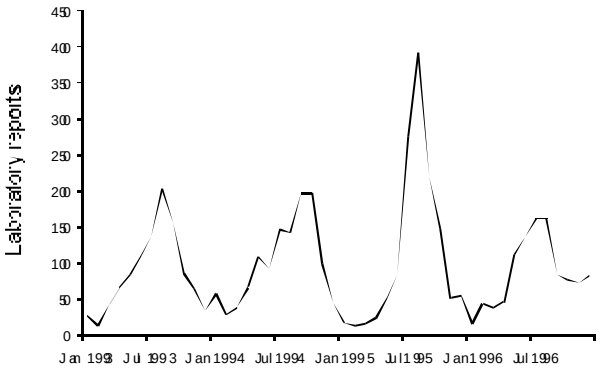
Rotaviruses are the major cause of severe acute diarrhoea in infants and young children throughout the world.[1,2] In Australia, the pathogen is believed to be responsible for the annual admission of up to 12,000 children to hospitals nationwide.[3] Rotavirus infection is the cause of approximately 50% of the admissions to hospital with acute gastroenteritis of children under 5 years of age.[3] The rates of hospitalisation between the States can vary markedly, with New South Wales, Queensland and South Australia having almost twice the rate of hospitalisation as Victoria.[3]

Rotavirus incidence generally follows a typical seasonal pattern in temperate regions of the country, with peaks in mid to late winter[2] (Figure 1) (personal communication, Professor Ruth Bishop, Department of Gastroenterology, Royal Children's Hospital, Parkville Victoria).

Figure 1. Laboratory reports of rotavirus, Australia 1993-1996, by month of specimen collection



Source of data: Four year Australia-wide rotavirus surveillance study, 1993-1996 (personal communication, Professor Ruth Bishop, Department of Gastroenterology, Royal Children's Hospital. Parkville Victoria).

Previous studies in the laboratories at the Royal Children's Hospital have shown the prevalence of the four major serotypes G1,G2,G3 and G4 differs from centre to centre and from year to year, with serotype G1 strains the most prevalent.[4] Larger population centres generally experience greater serotype diversity within any one year. Analysis of the strains by gel electrophoresis has shown up to 10 different electropherotypes can exist within a serotype within one year and are often replaced by new electropherotypes every season. The coexistence of similar electrophoretic strains between adjacent centres such as Melbourne and Hobart is not uncommon.

New rotavirus strains are emerging continually. We have identified novel human strains that have been assigned serotype G6and G8.[5,6] These serotypes are rare in humans and are normally associated with disease in cattle. The strains are believed to be derived from reassortment between human and bovine viruses. These reassortant strains are new to Australia and their novel genetic make-up gives us an indication of how rotaviruses evolve and diversify. Our genetic analysis of the strains generated from rotavirus surveillance provides information about the existence of distinct genetic lineages of rotaviruses within serotypes and the temporal changes occurring in these.

Rotavirus strains with unusual genetic and antigenic properties were discovered in children in Alice Springs and Darwin between December 1993 and August 1994.[7] The strains were responsible for outbreaks resulting in the hospitalisation of approximately 140 children. DNA analysis of the strains causing the outbreak found them to be reassortants between the two major defined genogroups of human rotaviruses. Information about the diversity of rotaviruses enables us to assess the efficacy of rotavirus vaccines.

A candidate rhesus tetravalent rotavirus vaccine should be available in Australia soon. It uses a genetically modified rhesus rotavirus strain carrying genes expressing the major human G serotype specificities. Prior to the vaccine's release, accurate baseline data of rotavirus infections and the degree of antigenic and genetic variation in strains causing disease in humans, needs to be established. A comprehensive rotavirus surveillance study should address some of these issues. Such a study is currently being undertaken by the newly formed National Rotavirus Reference Centre (NRRC).The NRRC was established with the aims of conducting rotavirus surveillance, determining rotavirus prevalence, monitoring epidemics and characterising representative specimens by rotavirus serotype.

Established sentinel centres around Australia already collect rotavirus positive specimens for the centre. The NRRC is seeking rotavirus notifications from Australian laboratories that screen for rotavirus and would like to be informed about rotavirus outbreaks or epidemics. It is planned that representative numbers of positive specimens will be serotyped by enzyme immune assay and polymerase chain reaction (PCR). Findings for the first year of operation will be provided to the National Centre for Disease Control. Data will be collated and findings reported in *Communicable Diseases Intelligence* on a regular basis (approximately every 2 months). Assistance with this Australia-wide rotavirus surveillance will enable

the creation of a more comprehensive epidemiological profile of rotavirus infection in Australia.

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Enterovirus 71 outbreak in Western Australia associated with acute flaccid paralysis. Preliminary report.

Peter McMinn,[1] Ivan Stratov,[1] Gary Dowse[2]

There have been 6 cases of acute flaccid paralysis (AFP) identified in Perth, Western Australia since March 1999 (2 in March, 2 in April, 1 in May and 1 in June). All cases have been in children under 2 years of age. Four of these cases are associated with enterovirus shedding (throat and stool) and EV71 has been identified by neutralisation in 2 of the cases. Stool specimens from 4 of the cases have been submitted to the Polio Reference Laboratory in Melbourne. Poliovirus infection has been ruled out in the 2 cases with confirmed EV71 infection and is pending in 2 other AFP cases.

Three of the 6 cases have residual weakness 1-2 months after illness onset and 1 case remains in hospital with prolonged flaccid paralysis requiring ventilation.

In addition, 12 cases of aseptic meningitis associated with enterovirus shedding (1 CSF isolate, the other isolates from throat and stool) have been identified. These cases have occurred in association with a large epidemic of hand, foot and mouth disease (HFM) in Perth and in rural areas of Western Australia. One of the AFP cases comes from Kalgoorlie.

An enterovirus has been isolated from skin lesions or throat swabs from 15 uncomplicated HFM cases, and 3 of 4 skin isolates have been confirmed as EV71. The EV71 isolates come from individuals living across the Perth metropolitan area and Mandurah, suggesting that EV71 activity has been widespread in recent months.

The origin of this virus is unknown. Whilst the recent EV71 epidemics in South-East Asia suggest a possible source, the acute myelitis observed in the Perth cases is clearly different from the brainstem encephalitis which characterised the severely affected cases in those epidemics. Molecular epidemiological studies of the Perth EV71 isolates are underway.

Public health measures instituted at this stage have included widespread media coverage to raise public awareness, and information and fact sheets distributed to all general practitioners and acute hospitals. In addition, child-care centres across the State have been given information emphasising the importance of good hygiene, and that children with HFM should be excluded. Paediatric hospitals in other States and Territories have been advised.

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Communicable Diseases Surveillance

Highlights

Communicable Diseases Surveillance consists of data from various sources. The National Notifiable Diseases Surveillance System (NNDSS) is conducted under the auspices of the Communicable Diseases Network Australia New Zealand. The *CDI* Virology and Serology Laboratory Reporting Scheme (LabVISE) is a sentinel surveillance scheme. The Australian Sentinel Practice Research Network (ASPREN) is a general practitioner-based sentinel surveillance scheme. In this report, data from the NNDSS are referred to as 'notifications' or 'cases', whereas those from ASPREN are referred to as 'consultations' or 'encounters' while data from the LabVISE scheme are referred to as 'laboratory reports'.

Vaccine Preventable Diseases

Meningococcal disease

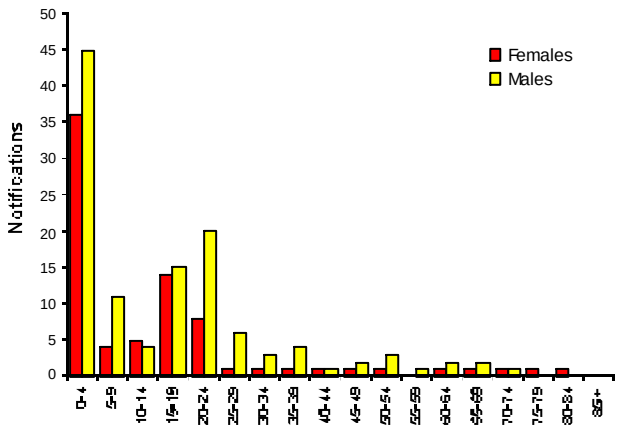
There have been 193 notifications of meningococcal disease so far this year. This is an overall increase of 40 notifications for the same reporting period in 1998 (Table 1).

Table1. Notifications of meningococcal disease, States and Territories, Jan-June 1998 and 1999

	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Aus
1998	1	66	5	36	5	4	22	19	158
1999	0	83	5	29	8	6	39	23	193

Sixty two per cent of these notifications were from males. Most notifications were in the 0-4 age group (Figure 1.)

Figure 1. Notifications of meningococcal disease, January – June 1999, by age group and sex

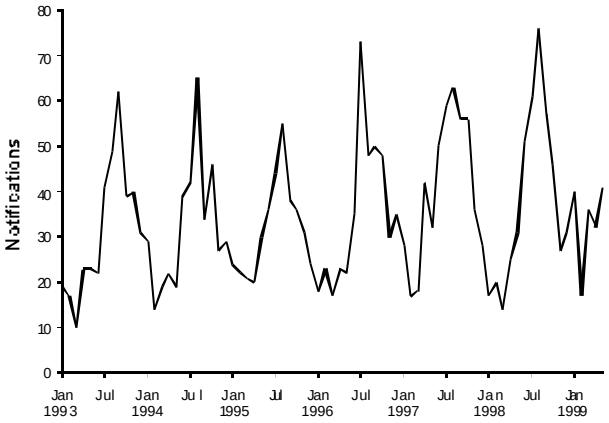


Higher rates of meningococcal disease were evident in males in most age groups compared to females. The peak month of onset of meningococcal disease is usually August.

Measles

The number of measles notifications remains low, with the outbreak among young adults in Victoria confirmed as having ended. With the end of this outbreak notifications for measles have returned to the low figures seen in December 1998 (Figure 2).

Figure 2. Notifications of meningococcal disease, Australia, 1993 to 1999, by month of onset



Arboviruses

Ross River virus

Although a higher than normal number of notifications for Ross River virus infection has been reported (2,777 this year to date), the very high number of cases seen in 1992 (approximately 5,800) and 1996 (approximately 7,850) is not expected. Further investigation of the notifications for the year to date show that the number of notifications is beginning to decline in line with the usual annual cycle of a greater number of cases during the warmer months of the year.

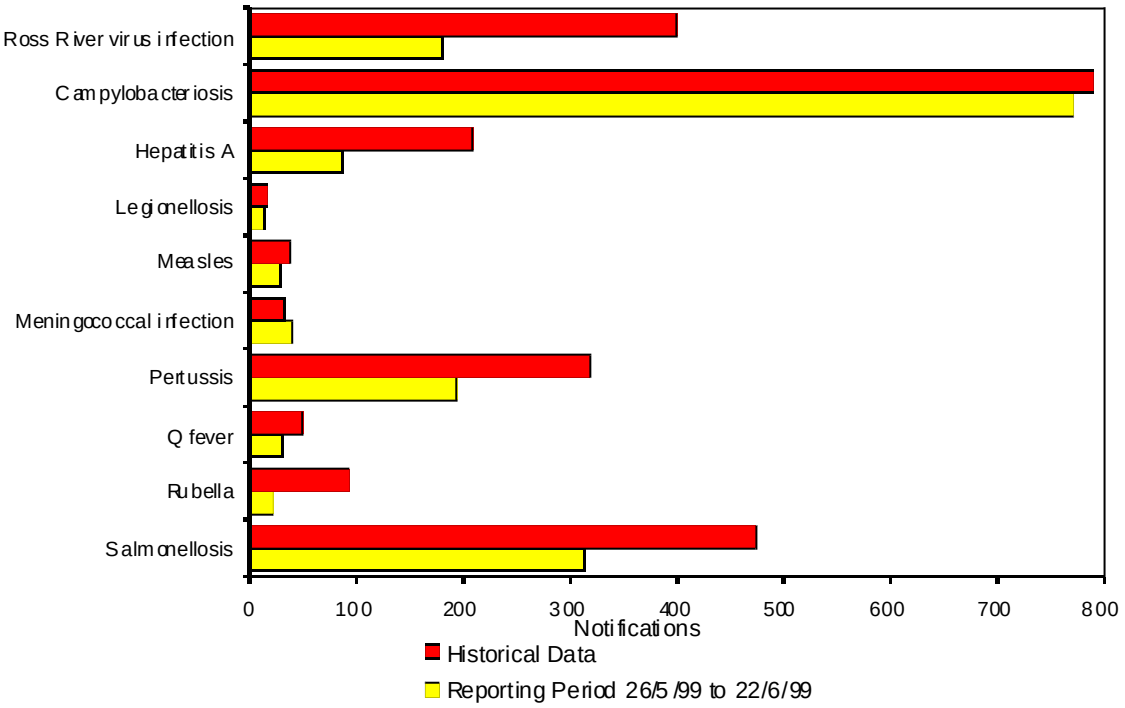
Tables

There were 5,790 notifications to the National Notifiable Diseases Surveillance System (NNDSS) in the four week period, 26 May to 22 June 1999 (Tables 1 and 2). The numbers of reports for selected diseases have been compared with historical data for corresponding periods in the previous three years (Figure 3).

There were 3,099 reports received by the *CDI* Virology and Serology Laboratory Reporting Scheme (LabVISE) in the four week period, 20 May to 16 June 1999 (Tables 3 and 4).

The Australian Sentinel Practice Research Network (ASPREN) data for weeks 21 to 24, ending 20 June 1999, are included in this issue of *CDI* (Table 5).

Figure 3. Selected National Notifiable Diseases Surveillance System reports, and historical data[1]



1. The historical data are the averages of the number of notifications in the corresponding 4 week periods of the last 3 years and the 2 week periods immediately preceding and following those.

Table 1. Notifications of diseases preventable by vaccines recommended by the NHMRC for routine childhood immunisation, received by State and Territory health authorities in the period 26 May to 22 June 1999

Disease[1,2]	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	This period 1999	This period 1998	Year to date 1999	Year to date 1998
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0
H. influenzae type b infection	0	1	0	0	0	0	0	0	1	2	20	14
Measles	3	3	0	0	0	0	6	1	13	23	166	176
Mumps	1	1	0	2	0	1	7	1	13	11	77	79
Pertussis	5	58	0	27	15	12	67	10	194	317	1,557	3,724
Rubella[3]	2	2	0	5	0	0	9	4	22	67	166	364
Tetanus	0	0	0	0	0	0	0	0	0	1	0	3

NN. Not Notifiable

1. No notification of poliomyelitis has been received since 1978.
2. Totals comprise data from all States and Territories. Cumulative figures are subject to retrospective revision, so there may be discrepancies between the number of new notifications and the increment in the cumulative figure from the previous period.
3. Includes congenital rubella.

Table 2. Notifications of diseases received by State and Territory health authorities in the period 26 May to 22 June 1999

Disease[1,2,3,4]	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	This period 1999	This period 1998	Year to date 1999	Year to date 1998
Arbovirus infection (NEC)	0	0	1	1	0	0	1	1	4	5	66	42
Barmah Forest virus infection	0	0	0	14	0	0	1	4	19	32	232	352
Brucellosis	0	0	0	2	0	0	0	0	2	1	11	20
Campylobacteriosis[5]	26	-	21	138	211	29	254	92	771	647	5,918	4,989
Chancroid	0	0	0	0	0	0	0	0	0	0	0	1
Chlamydial infection (NEC)[6]	10	NN	68	262	84	17	280	111	832	826	7,817	5,112
Cholera	0	0	0	0	0	0	0	0	0	0	2	3
Dengue	0	0	0	0	0	0	0	6	6	17	146	286
Donovanosis	0	NN	0	0	NN	0	0	1	1	3	9	19
Gonococcal infection[7]	3	76	89	78	26	1	0	67	340	408	2,343	2,490
Haemolytic uraemic syndrome[8]	NN	1	0	0	1	0	NN	0	2	0	13	6
Hepatitis A	0	37	0	12	16	0	13	9	87	180	820	1,570
Hepatitis B incident	0	12	0	5	2	0	4	2	25	17	167	128
Hepatitis B unspecified[9]	6	153	0	48	0	3	191	108	509	606	3,196	3,438
Hepatitis C incident	1	0	0	-	5	0	1	3	10	31	155	135
Hepatitis C unspecified[9]	29	359	20	173	67	26	414	50	1,138	1,594	9,339	10,557
Hepatitis (NEC)[10]	0	2	0	0	0	0	1	NN	3	2	7	9
Hydatid infection	0	0	0	0	0	0	4	0	4	2	16	16
Legionellosis	0	6	1	1	3	0	3	0	14	16	151	122
Leprosy	0	0	0	0	0	0	0	0	0	0	0	2
Leptospirosis	0	4	0	14	0	0	0	0	18	10	240	78
Listeriosis	0	1	0	0	0	0	0	1	2	1	21	27
Malaria	1	12	3	8	2	0	8	3	37	151	358	382
Meningococcal infection	0	9	1	10	1	1	11	7	40	37	197	133
Ornithosis	0	NN	0	0	0	0	0	0	0	5	39	18
Q Fever	0	12	0	18	0	0	0	1	31	36	222	259
Ross River virus infection	1	0	0	130	1	5	3	41	181	155	2,777	2,216
Salmonellosis (NEC)	4	43	22	103	33	7	55	47	314	486	4,728	4,522
Shigellosis[5]	0	-	13	4	2	0	8	7	34	41	311	333
SLTEC, VTEC[11]	NN	0	0	NN	1	0	NN	NN	1	3	13	7
Syphilis[12]	0	26	50	60	1	2	0	16	155	106	919	639
TTP[13]	0	0	0	0	0	0	0	0	0	0	0	0
Tuberculosis	0	60	2	5	1	1	30	2	101	110	698	610
Typhoid[14]	0	3	0	0	0	0	4	1	8	2	36	50
Yersiniosis (NEC)[5]	0	-	0	2	0	0	0	1	3	17	83	138

1. Diseases preventable by routine childhood immunisation are presented in Table 1.
2. For HIV and AIDS, see Tables 6 and 7.
3. Totals comprise data from all States and Territories. Cumulative figures are subject to retrospective revision so there may be discrepancies between the number of new notifications and the increment in the cumulative figure from the previous period.
4. No notifications have been received during 1999 for the following rare diseases: lymphogranuloma venereum, plague, rabies, yellow fever, or other viral haemorrhagic fevers.
5. Not reported for NSW because it is only notifiable as 'foodborne disease' or 'gastroenteritis in an institution'.
6. WA: genital only.
7. NT, Qld, SA and Vic: includes gonococcal neonatal ophthalmia.
8. Nationally reportable from August 1998.
9. Unspecified numbers should be interpreted with some caution as the magnitude may be a reflection of the numbers of testings being carried out.
10. Includes hepatitis D and E.
11. Infections with *Shiga*-like toxin (verotoxin) producing *E. Coli* (SLTEC/VTEC) became nationally reportable in August 1998.
12. Includes congenital syphilis.
13. Thrombotic thrombocytopaenic purpura became nationally reportable in August 1998.
14. NSW, Qld: includes paratyphoid.

NN Not Notifiable.

NEC Not Elsewhere Classified.

- Elsewhere Classified.

Table 3. Virology and serology laboratory reports by State or Territory[1] for the reporting period 20 May to 16 June 1999, and total reports for the year

	State or Territory[1]									
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Total this period	Total reported in *CDI* in 1999
Measles, mumps, rubella										
Measles virus		1	2	1	3		13	5	25	143
Mumps virus								11	11	37
Rubella virus				12	2			4	18	56
Hepatitis viruses										
Hepatitis A virus		2	2	9	6		2	37	58	229
ARBOVIRUSES										
Ross River virus		7	17	124	2		7	128	285	1,183
Barmah Forest virus		1	4	29			2	10	46	129
Dengue not typed		1	1					13	15	45
Murray Valley encephalitis virus								1	1	2
Kunjin virus			1					2	3	5
Adenoviruses										
Adenovirus type 1							4		4	16
Adenovirus type 2							1		1	8
Adenovirus type 3					4		5		9	27
Adenovirus type 4					1		3		4	7
Adenovirus type 37							4		4	12
Adenovirus type 40			1					11	12	38
Adenovirus not typed/pending		23		8	24		44	41	140	643
Herpes viruses										
Herpes virus type 6								3	3	6
Cytomegalovirus		28	1	24	24		51	24	152	642
Varicella-zoster virus		15	4	36	36		63	66	220	933
Epstein-Barr virus		21	8	84	67		18	109	307	1,379
Other DNA viruses										
Papovavirus group								5	5	10
Molluscum contagiosum								4	4	10
Contagious pustular dermatitis								3	3	11
Poxvirus group not typed							1		1	2
Parvovirus	1		1	3	3		42	16	66	227
Picorna virus family										
Coxsackievirus A9							3		3	3
Coxsackievirus A10							1		1	1
Echovirus type 4							1		1	3
Echovirus type 9		1				1			2	25
Echovirus type 11		6					1		7	43
Echovirus type 19		1							1	2
Poliovirus type 3 (uncharacterised)		1							1	3
Rhinovirus (all types)		25		1	4			20	50	201
Enterovirus type 71 (BCR)							1		1	1
Enterovirus not typed/pending		3	2	4			9	96	114	440

Table 3. Virology and serology laboratory reports by State or Territory[1] for the reporting period 20 May to 16 June 1999, and total reports for the year (continued)

	State or Territory[1]									
	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Total this period	Total reported in *CDI* in 1999
Ortho/paramyxoviruses										
Influenza A virus		39	1	13	26		37	20	136	399
Influenza A virus H1N1							1		1	2
Influenza A virus H3N2							4		4	7
Influenza B virus		3		1	3		5	11	23	71
Parainfluenza virus type 1		2		1	1		1		5	24
Parainfluenza virus type 2		2			4		18	6	30	55
Parainfluenza virus type 3		11		2	6		15	11	45	342
Respiratory syncytial virus		212	1	33	23	1	32	51	353	801
Other RNA viruses										
HTLV-1			1					1	2	8
Rotavirus		62		1	17		27	89	196	552
Astrovirus							1		1	2
Norwalk agent							15		15	49
Other										
Chlamydia trachomatis not typed		39	27	111	49	2	20	158	406	1,546
Chlamydia psittaci							15		15	47
Chlamydia species				2					2	8
Mycoplasma pneumoniae		25	2	29	7		56	27	146	659
Coxiella burnetii (Q fever)		3		12			7	4	26	91
Rickettsia - Spotted fever group								1	1	1
Rickettsia spp - other								2	2	5
Salmonella species								2	2	4
Bordetella pertussis		6		38			52	9	105	355
Legionella pneumophila					1			1	2	8
Legionella longbeachae					1			1	2	25
TOTAL	1	540	76	578	314	4	582	1,004	3,099	11,587

Table 4. Virology and serology laboratory reports by contributing laboratories for the reporting period 20 May to 16 June 1999

State or Territory	Laboratory	Reports
New South Wales	Institute of Clinical Pathology & Medical Research, Westmead	18
	New Children's Hospital, Westmead	110
	Royal Prince Alfred Hospital, Camperdown	113
	South West Area Pathology Service, Liverpool	274
Queensland	Queensland Medical Laboratory, West End	590
	Townsville General Hospital	39
South Australia	Institute of Medical and Veterinary Science, Adelaide	314
Tasmania	Northern Tasmanian Pathology Service, Launceston	3
Victoria	Monash Medical Centre, Melbourne	64
	Royal Children's Hospital, Melbourne	236
	Victorian Infectious Diseases Reference Laboratory, Fairfield	281
Western Australia	PathCentre Virology, Perth	787
	Princess Margaret Hospital, Perth	124
	Western Diagnostic Pathology	146
TOTAL		3,099

Table 5. Australian Sentinel Practice Research Network reports, weeks 21to 24, 1999

Week number	21		22		23		24	
Week ending on	30 May 1999		6 June 1999		13 June 1999		20 June 1999	
Doctors reporting	59		60		58		48	
Total encounters	7,590		7,632		7,610		5,525	
Condition	Reports	Rate (per 1,000 encounters)	Reports	Rate (per 1,000 encounters)	Reports	Rate (per 1,000 encounters)	Reports	Rate (per 1,000 encounters)
Influenza	66	8.7	65	8.5	62	8.1	80	14.5
Rubella	1	0.1	1	0.1	4	0.5	0	0.0
Measles	1	0.1	1	0.1	0	0.0	0	0.0
Chickenpox	12	1.6	13	1.7	6	0.8	11	2.0
New diagnosis of asthma	12	1.6	18	2.4	16	2.1	7	1.3
Post operative wound sepsis	6	0.8	11	1.4	11	1.4	5	0.9
Gastroenteritis	70	9.2	73	9.6	82	10.8	35	6.3

The NNDSS is conducted under the auspices of the Communicable Diseases Network Australia New Zealand. The system coordinates the national surveillance of more than 40 communicable diseases or disease groups endorsed by the National Health and Medical Research Council (NHMRC). Notifications of these diseases are made to State and Territory health authorities under the provisions of their respective public health legislations. De-identified core unit data are supplied fortnightly for collation, analysis and dissemination. For further information, see CDI 1999;23:55.

LabVISE is a sentinel reporting scheme. Twenty-one laboratories contribute data on the laboratory identification of viruses and other organisms. Data are collated and published in Communicable Diseases Intelligence every four weeks. These data should be interpreted with caution as the number and type of reports received is subject to a number of biases. For further information, see CDI 1999;23:58.

ASPREN currently comprises about 100 general practitioners from throughout the country. Up to 9,000 consultations are reported each week, with special attention to 12 conditions chosen for sentinel surveillance in 1999. CDI reports the consultation rates for seven of these. For further information, including case definitions, see CDI 1999;23:55-56.

Additional Reports

National Influenza Surveillance, 1999

Three types of data are included in National Influenza Surveillance, 1999. These are sentinel general practitioner surveillance conducted by the Australian Sentinel Practice Research Network, Department of Human Services (Victoria), Department of Health (New South Wales) and the Tropical Influenza Surveillance Scheme, Territory Health (Northern Territory); laboratory surveillance data from the Communicable Diseases Intelligence Virology and Serology Laboratory Reporting Scheme, LabVISE, and the World Health Organization Collaborating Centre for Influenza Reference and Research; and absenteeism surveillance conducted by Australia Post. For further information about these schemes, see CDI 1999; 23:56.

Sentinel general practitioner surveillance

An increase in consultation rates for influenza-like illness reported by the ASPREN, NSW and Victorian schemes was apparent in April (Figure 1). Rates for influenza-like illness recorded by ASPREN were lower this year than for the same period in 1998. In contrast, the consultation rates

Figure 1. Sentinel general practitioner influenza consultation rates, 1999, by scheme and week

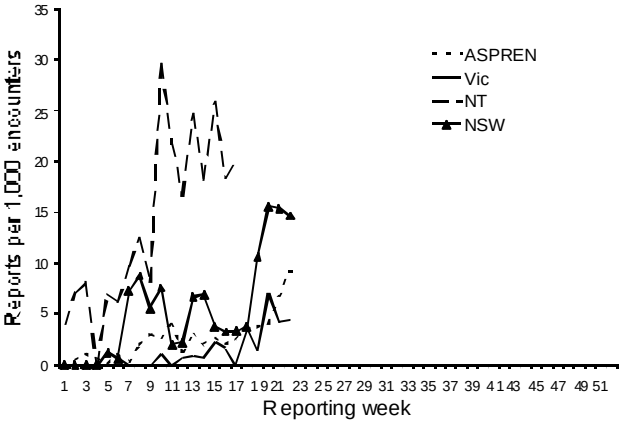


Figure 2. Laboratory reports of influenza, 1998-99, by week of specimen collection

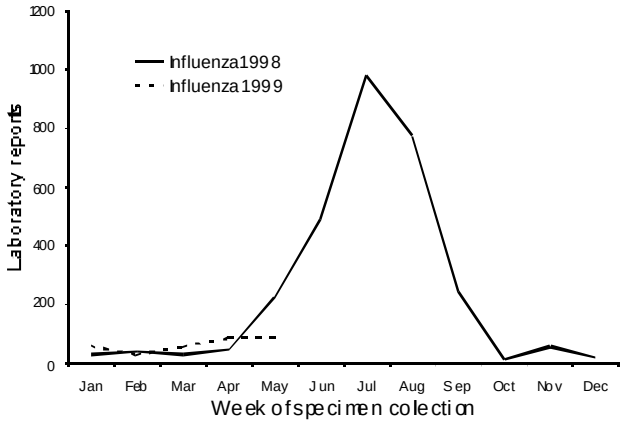
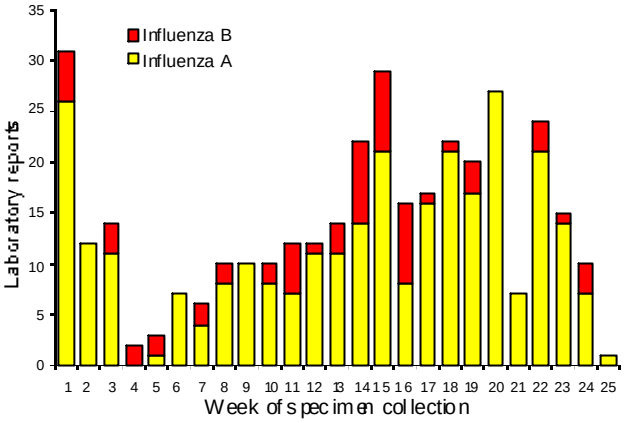


Figure 3. Laboratory reports of influenza, 1999, by type and by month of specimen collection



for influenza activity reported by the Tropical Influenza Surveillance Scheme showed higher rates from March to May than for the same period in 1998. Victorian rates were similar to those recorded for the corresponding period in 1998.

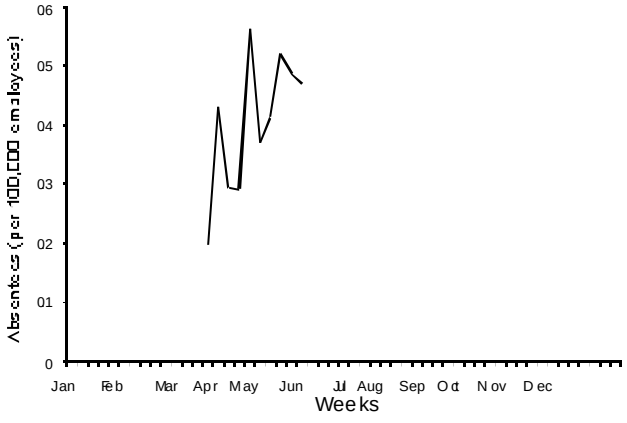
Laboratory surveillance

Figure 2 shows the number of laboratory reports for 1998 and 1999. Data for 1999 is provided only for January to May. For the year to date there have been 354 laboratory reports of influenza. Of these 290 (82%) were influenza A and 64 (18%) were influenza B (Figure 3). Of the influenza A that have been typed, 7 strains have been characterised as influenza H3N2 and 2 strains as influenza H1N1.

Absenteeism surveillance

Australia Post reports employees absent if they are not at work for three or more consecutive days in one week. The average rates for May were 0.45% which is higher than for May 1998 (0.28%)(Figure 4).

Figure 4. Absenteeism rates in Australia Post, 1999



HIV and AIDS Surveillance

National surveillance for HIV disease is coordinated by the National Centre in HIV Epidemiology and Clinical Research (NCHECR), in collaboration with State and Territory health authorities and the Commonwealth of Australia. Cases of HIV infection are notified to the National HIV Database on the first occasion of diagnosis in Australia, by either the diagnosing laboratory (ACT, New South Wales, Tasmania, Victoria) or by a combination of laboratory and doctor sources (Northern Territory, Queensland, South Australia, Western Australia). Cases of AIDS are notified through the State and Territory health authorities to the National AIDS Registry. Diagnoses of both HIV infection and AIDS are notified with the person's date of birth and name code, to minimise duplicate notifications while maintaining confidentiality.

Tabulations of diagnoses of HIV infection and AIDS are based on data available three months after the end of the reporting interval indicated, to allow for reporting delay and to incorporate newly available information. More detailed information on diagnoses of HIV infection and AIDS is published in the quarterly Australian HIV Surveillance Report, and annually in HIV/AIDS and related diseases in Australia Annual Surveillance Report. The reports are available from the National Centre in HIV Epidemiology and Clinical Research, 376 Victoria Street, Darlinghurst NSW 2010. Telephone: (02) 9332 4648; Facsimile: (02) 9332 1837; http://www.med.unsw.edu.au/nchecr.

HIV and AIDS diagnoses and deaths following AIDS reported for 1 to 28 February 1999, as reported to 31 May 1999, are included in this issue of CDI (Tables 6 and 7).

Table 6. New diagnoses of HIV infection, new diagnoses of AIDS and deaths following AIDS occurring in the period 1 to 28 February 1999, by sex and State or Territory of diagnosis

		State or Territory								Totals for Australia			
		ACT	NSW	NT	Qld	SA	Tas	Vic	WA	This period 1999	This period 1998	Year to date 1999	Year to date 1998
HIV diagnoses	Female	1	3	0	1	0	0	2	0	7	7	10	10
	Male	0	18	0	8	1	0	8	2	37	56	79	118
	Sex not reported	0	0	0	0	0	0	0	0	0	2	1	2
	Total[1]	1	21	0	9	1	0	10	2	44	65	90	130
AIDS diagnoses	Female	0	0	0	1	0	0	0	0	1	0	1	2
	Male	0	2	1	5	0	0	0	1	9	26	14	52
	Total[1]	0	2	1	6	0	0	0	1	10	26	15	54
AIDS deaths	Female	0	0	0	0	0	0	0	0	0	0	0	0
	Male	0	3	0	1	0	0	0	0	4	14	20	26
	Total[1]	0	3	0	1	0	0	0	0	4	14	21	26

1. Persons whose sex was reported as transgender are included in the totals.

Table 7. Cumulative diagnoses of HIV infection, AIDS and deaths following AIDS since the introduction of HIV antibody testing to 31 May 1999, by sex and State or Territory

		State or Territory								
		ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Australia
HIV diagnoses	Female	23	585	8	132	57	5	201	105	1,116
	Male	188	10,535	104	1,878	651	77	3,765	876	18,074
	Sex not reported	0	258	0	0	0	0	25	0	283
	Total[1]	211	11,397	112	2,017	708	82	4,004	984	19,515
AIDS diagnoses	Female	8	170	0	46	20	3	67	26	340
	Male	85	4,521	34	791	326	44	1,586	344	7,731
	Total[1]	93	4,703	34	839	346	47	1,660	372	8,094
AIDS deaths	Female	2	113	0	30	15	2	47	16	225
	Male	63	3,125	24	554	224	28	1,238	245	5,501
	Total[1]	65	3,246	24	586	239	30	1,291	262	5,743

1. Persons whose sex was reported as transgender are included in the totals.

Overseas briefs

Source: World Health Organization (WHO)
This material has been condensed from information on the WHO Internet site. A link to this site can be found under 'Other Australian and international communicable diseases sites' on the CDI homepage.

Cholera

Zambia

The cholera outbreak which began early in the year has continued, and a total of 11,327 cases with 393 deaths has been reported up to 4 June. The majority of cases occurred in Lusaka district in the South-East region (Central province). Recently the situation has stabilised in most areas and the control measures which were implemented have been successful. However, new outbreaks have been reported in Chilubi and Samfya districts in Northern province where health workers are taking measures to control the situation.

Burundi. Following notification of an increase in cholera cases at the main hospital, a team from *Médecins sans frontières* and WHO went to the area to investigate and to initiate control measures.

From 24 May to 5 June a total of 89 cases with 6 deaths had occurred. No cases have been reported among the refugees from the Democratic Republic of the Congo who passed through the area during that period. The cause of the outbreak was probably the early onset of the dry season and consequent drinking of water from the lake, as well as lack of preventative measures by the population.

A cumulative total of 587 cases had previously been reported in Burundi since the beginning of the year.

Madagascar. The cholera outbreak which began in March, is still continuing in both Mahajanga and Antananarivo Provinces. The majority of cases occurred in several districts of Mahajanga (3,365 cases 215 deaths) up to 15 June. A total of 642 cases and 3 deaths occurred in Antananarivo Province up to the same date.

Honduras. A cholera outbreak has been reported in areas bordering Nicaragua and Guatemala. Thirty-two cases have occurred to date, 20 of which (not yet laboratory confirmed) occurred in La Mosquitia area. The health authorities of Honduras, Nicaragua and Guatemala are cooperating to control the disease and prevent further spread. Technical assistance is being provided by the WHO Regional Office for the Americas.

Nicaragua. A total of 359 cases with 7 deaths has been reported up to 5 June. The most affected regions are: Region Autonoma Atlantico Norte (R.A.A.N.), Managua, Nueva Segovia and Jinotega.

Afghanistan. A suspected cholera outbreak has been reported in the Central Region which began on 29 May. Three out of 4 samples tested have been laboratory confirmed. In the South-Eastern Region (Ghazni) a suspected cholera outbreak has also been reported and an investigation team has been sent to verify the outbreak and to take samples.

Brunei Darussalam. A cholera outbreak has been reported in Muara District by the health authorities. There have been 72 confirmed cases and 29 suspect cases up to 18 June. Thirty-two of the cases were in an outbreak at a school, most with date of onset on 3 June. No secondary cases have been detected. The source of the outbreak has not yet been identified and prevention and control measures are continuing.

Malaria in Burundi

Between January and May 1999, a total of 616,034 cases of malaria was reported by health centres. In January, all provinces were affected, and although only 75% of provinces were affected in May, there was a significant increase in some (especially Karusi, with 2.5 times more cases in May than in April).

A comparison of data for May 1998 and May 1999 has shown that in some provinces, cases have increased very sharply (e.g. Mutoyi, from 3,094 to 7,568; Rutoke, from 293 to 1 768). Mortality figures are not available for all provinces. In Mutoyi, a total of 17 deaths was registered between January and May; in Karusi, 34 deaths were recorded between 15 May and 15 June.

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